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ABSTRACT

Control of mass communication information has become a matter of increasing concern in scholarly circles. The emphasis by UNESCO in recent years on national communication policies is related to this concern. One important justification offered for focusing attention on communication policies has been their impact on development efforts. Certain mass communication policies at the national level will affect the success or failure of efforts at economic development. Analysis of available data suggests that a basic role of high centrality of mass communication information control in development is one of coordination of system units within relatively homogeneous and small nations. For such nations, centrality is moderately associated with economic growth. For large and heterogeneous countries, centrality of control appears to be unrelated to rate of economic development, or even to assume a negative relationship. Though further research is needed to confirm initial impressions, policy makers should carefully consider the interactions of present and proposed policies with national functional and structural characteristics. (Author/JM)

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MASS COMMUNICATION INFORMATION CONTROL AND NATIONAL DEVELOPMENT

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ABSTRACT: Control of mass communication information has become a matter of increasing concern in scholarly circles. The emphasis by Unesco in recent years on national communication policies is related to this concern.

One important justification offered for focusing attention on communication policies has been their impact on development efforts. It is held that certain mass communication policies at the national level will affect the success or failure of efforts at economic development.

Analysis of available data suggests that a basic role of high centrality of mass communication information control in development is one of coordination of system units within relatively homogeneous and small nations. For such nations, centrality is moderately associated with economic growth. For large and heterogeneous countries, on the other hand, centrality of control appears to be unrelated to rate of economic development, or even to assume a negative relationship.

Though a good deal of further research will be needed to confirm these initial impressions, it does appear that policy makers should carefully consider the interactions of present and proposed policies with national functional and structural characteristics.

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MASS COMMUNICATION INFORMATION CONTROL AND NATIONAL DEVELOPMENT

Control of mass communication information has become a matter of increasing concern around the world in recent years. Unesco has sponsored several meetings dealing with national communication policies, and it has scheduled the first Intergovernmental Conference on that topic (Lee, 1976). Scholars have begun to elaborate the theoretical basis for understanding mass communication information control (Donohue, Tichenor, and Olien, 1973).[1*] Concerned observers have called for more attention to current patterns of control and their effects on development (Beltran S., 1969; Dorfman and Mattelart, 1971; Inayatullah, 1967; Katz, 1973; Kekkonen, 1973; McDermott, 1969; Mann, 1970; Mattelart, 1973; Mattelart, Biedma and Funes, 1971; Nedzynski, 1973; Nordenstreng and Varis, 1973; Schiller, 1967, 1970, 1973, 1974; Smythe , 1973; Wells, 1972).

A key aspect of information control appears to be the degree to which it is centralized into the hands of a society's elites. So far as national development today is concerned, the "control subsystems" of society, the subsystems concerned with establishing goals and implementing programs for their realization (Hall and Fagen, 1968:86), typically are composed of a relatively small group of persons who constitute the country's political leadership, or its power elite in Black's sense (1966:62-63).

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*Notes may be found at the end of the paper.

Complete centralization of mass communication information control would consist of having all aspects of a nation's mass communication information totally controlled by members of a single cohesive elite. Complete decentralization would see all mass communication information control decisions diffused outside the elite's control. The contrast is between the focus of control in the hands of a few individuals who also are in commanding positions in the political life of a country, as opposed to the diffusion of control widely throughout a society. (This definition parallels that of Levy (1966:16-17) for centralization in a society in general.)

No country ever reaches a state of either complete centrality or complete diffuseness of mass communication information control.[2] Even in the Soviet Union, which has one of the most highly controlled mass communication systems seen in the history of mankind (Siebert, Peterson, and Schramm, 1956:5), "human nature," working within "the immensity of the Soviet political bureaucracy and the mass media network," finds chinks in the pervading official control pattern (Hopkins, 1970:148-149). Thus a new pattern of control is created. On the other hand, complete decentralization of mass communication information control might occur only in times of mass chaos, such as perhaps might be experienced in the midst of widespread population uprisings. As Hopkins generalizes,

> No society allows its mass media to roam at will, entirely free to disseminate to a mass audience all events and thoughts they choose. ... And, the reverse, no system of mass communications, regardless of political or economic affiliations in its society, is ever perfectly managed. Rather, societies chart out areas in which the press operates with little hindrance and often much encouragement (1970:109).

The power elite consists not only of those holding formal governmental positions, but also of persons in other positions of political power. Centrality of mass communication information control is not identical to control by government, then. An example is Colombia, where control is highly centralized, although the largest newspapers in the country are in the hands of leaders of opposing political parties, not all of whom will be in office at one time. (Merrill, Bryan, and Alisky, 1970:212; see also Sommerlad, 1966:47.)

Kenya illustrates another pattern. There the press is almost completely under the ownership of foreign interests (Hachten, 1971:199-219). Newspapermen are extremely sensitive to government wishes, however, and direct orders are seldom necessary to achieve a form of newspaper content that falls within the bounds of the desires of the political elite.

The situation in Kenya also provides an example of an additional aspect of control. Concentration of ownership of the mass media of a nation into only a few hands leaves the media in a vulnerable position vis-a-vis the central elite. Nixon and Hahn have pointed out that press ownership

is much more highly concentrated in the developing countries than in the rich nations. This fact alone, they wrote,

> may suggest why the press in certain underdeveloped countries sometimes changes so quickly from control by a few private owners to control by a few in the government. For if only a few individuals are involved on either side, it really may make very little difference to anyone else (1971:16).

Concentration of ownership of mass communication institutions is not identical to centralization of control of mass communication information, but high concentration does leave mass media more open to central control than if ownership is widely diffused. High concentration also seems to be associated with a high degree of indirect central control.

National elites need not form a cohesive, monolithic front. Where major divisions occur within a national elite, centrality of control may well be diminished. In South Africa, for example, the Afrikaans press is under the wing of the Nationalist Party, which leads these papers to support the Party endorsement of apartheid. The Argus group, on the other hand, is dominated by mining interests who object to apartheid because its costliness requires that they be taxed at a high rate (Merrill, Bryan, and Alisky, 1970:278). At least limited divergencies may be expected within any national elite, and it is not uncommon to find them reflected in control of mass communication institutions.

Two aspects of centrality of mass communication information control may be identified, then. One is the degree to

which control is centralized in the hands of a national elite. The other concerns the degree to which the national elite in a country with a relatively high degree of centrality of control agrees among itself on goals and programs. Deep differences often may be reflected in media content which has characteristics associated with some of the systems in which control is widely diffused: open comment on basic goals of the society, aggressive reporting, disagreement among media outlets. These characteristics may be present despite a high degree of centrality of control of mass communication information into the hands of an elite taken as a whole.

The similarities may be only transitory in the common case, however. What frequently seems to happen is that one or another of the contending forces within the elite captures the power to serve exclusively as the nation's control subsystem. This seems to be what happened in Chile, for example, when a vigorous press under Allende was decimated and muzzled under the generals who deposed him. Relative stability of contending forces in societies with a high degree of centrality of power, as in Colombia, would seem to be the exception, and the exception would seem to require, as in Colombia, agreement on the procedural rules for conduct of the process of conflict. In societies with a high degree of intra-elite conflict, an imposed consensus seems the more common result.

IMPLICATIONS FOR NATIONAL DEVELOPMENT

Development may be defined as an increase in system goal

realization. The focus is on changes in goal realization, rather than simply on the absolute level. It seems reasonable to assume that a major goal of most nations in the past few decades has been economic growth.[3]

To achieve goals, general systems theorists postulate, units of a system must act in a coordinated manner (Miller, 1965:343, 349; Naylor, 1970:211-212). At the level of the nation, coordination of system units is necessary in part because development is a process of change, and change leads to conflict. The conflict may be of several types: physical clashes between different groups; conflict between sets of values that have been carried over from earlier times but which can no longer be held simultaneously (Holt and Turner, 1966:265-266); conflict resulting from changes in policies from precept to norm, or vice versa (Holt and Turner, 1966:255); conflict between fear of the unknown and the need to explore it in order to cope with a changing environment; conflict between different ones of the plural roles individuals play; conflict between ignorance and knowledge.

Without coordination, conflict can grow into chaos, stopping all movement toward development. Or conflict might result in a stagnant standoff. Some minimal level of conflict may be necessary for any development to take place, but if conflict grows beyond a certain level, positive development results will be impossible.

The need for coordination encompasses parts of two functional requisites for development postulated by Holt and

Turner (1966:52-53) as adapted from the work of Parsons, "pattern maintenance" and "integration." Under the pattern-maintenance function would fall such coordinating activities of mass communication as enculturation into society's values, reward through publicity of those who embody favored values, and punishment through a different sort of publicity. These are means of demonstrating through the picture of the world presented in the mass media that the dominant values of the society are indeed the ones which should be accepted.

Closely related would be activities falling under the integration function, such as providing information about the role expectations and demands of those who differ from the audience member in age, social class, occupation, or place of residence. Provision of such information allows members of a society to interact more freely, it is assumed. (See McClelland, 1961:192ff; Schramm, 1963:41-42.) What might be termed the objective bases for conflict may be overcome to some extent. The mass communication process also may be used to make economic and financial information widely available, allowing audience members to coordinate their activities with reference to common points (Hayek, 1945).

Effective coordination involves all three aspects of the information needs of societies undergoing development: distributive, lateral, and feedback (Schramm, 1964: 37, 42-43). Not only must information flow from elites to other members of the society, but elites must learn what is happening in the

rest of the country, and individuals must be aware to some extent of the situations of others on their same social level. Information control processes may operate on any of the three aspects.[4]

By far the vast bulk of the work on communication and development and on information control has dealt with distributive aspects. Little attention has been paid to lateral and feedback communication. Perhaps this is because in the poorest countries observers perceive a greater need for distribution of information to accomplish basic tasks such as creation of a sense of nationhood. Perhaps it is related to the greater visibility of institutions which play primarily distributive roles, such as the mass media. Or perhaps a conception of communication which lacks a feedback component, which places primary stress on what the media "can do," without sufficient attention to the context, has been related to this focus of attention. Whatever the reason for this stress in the past, it seems well-accepted today that the mass communication process does involve feedback as an essential characteristic.

Will a high level of centrality of mass communication information control be favorable or unfavorable to development? Given the basic nature of the coordination task and the variety of needs for coordination posited by social theorists, it would seem that a relatively high degree of centrality would aid development efforts.

This proposition must be qualified. First, in any empirical situation a large number of factors may be relevant in studying the relationship between centrality of mass communication information control and development. Three of these will be examined below: Functional differentiation, cultural heterogeneity, and size. That hardly exhausts the list, however, and although these three are felt to be important concepts when considering the basic proposition, many others could be examined. Availability of useful data played a part in the choice of the three factors studied, as well as their theoretical relevance.

Second, the theoretical framework from which the proposition is drawn is rather loose. This stems from at least two sources: the ambiguity of general systems theory when applied to large, relatively open systems such as countries, and the variety of social science literature relevant to the question of control and development. An open, eclectic theoretical framework is viewed as an advantage at this stage of research on centrality of mass communication information control and development. Such an approach to theory would seem likely to offer more in the way of hueristic possibilities for this new focus than would a more tightly structured treatment.

Third, at this time it would appear presumptious to make categorical claims concerning a proposition such as the one presented above when there is little in the way of information with which to evaluate it. While a first preliminary analysis

is presented below, it cannot by any means be considered conclusive. It should be viewed, rather, as suggestive of the possibilities of the approach.

CULTURAL HETEROGENEITY AND SIZE

It has been asserted that information programs aimed at innovation must be adapted to local circumstances (Brown and Kearl, 1967; Fett, 1975; Schramm, 1964:86, 123). In many countries, differences among communities from one part of the nation to another are striking. Variations may be found in language, religion, social norms and values, and other aspects of culture.

Cultural heterogeneity refers to the number of culturally distinct units within a system. The concept differs from functional differentiation in that the distinct units may perform the same function within the system. At the same time, it differs from segmentation in its stress on cultural aspects, as opposed to other ways in which units may be characterized. (See Sorokin, 1968; Marsh, 1967: 31.)

Varying local circumstances require that some aspects of mass communication information control be spread out from the control centers of a nation to its social periphery. Whether it be recent immigrants to the slums of a capital city, or isolated villagers deep in high mountain valleys, audiences for mass communication must receive messages stated in their own terms if they are to understand and act on them.

High centrality of mass communication information control in culturally heterogeneous countries may have several possible adverse consequences: low comprehension of messages, lack of useful information, inappropriate information, distortion of information, poor timing in information delivery. For example, radio programs may be broadcast in dialects unintelligible to intended audiences. Farmers may be urged to plant grains which are not edible to both humans and animals, ignoring actual use of crops. Programs directed at farmers may be scheduled when they are in their fields, miles from the nearest radio.

The difficulty of central coordination increases even more rapidly than the number of distinct heterogeneous components in a system. The number of links among system components increases extremely quickly as the number of components rises. Where n = the number of units and L = the number of potential links, the formula is

$$L = 2^n - 1.$$

For these reasons, it is expected that at the higher levels of heterogeneity great centrality of mass communication information control will hinder efforts at development.

It has been held that the size of a social system has a great effect on communication. In a recent study, the proportion of total system resources devoted to communicative activities was found to increase with the size of the social system on three different system levels, the institutional, the communal, and the societal (Kasarda, 1974:19). This

may be an indication of the greater difficulty of achieving what is felt to be adequate performance of the integrative function through communication as system size increases (Holt and Turner, 1966:220-223).

One reason for increasing difficulty in integration as size rises may be a concomitant increase in heterogeneity, the consequences of which were discussed above. Independent of that factor, however, increasing geographic size also is associated with increasing channel lengths. Long channels decrease the chances of success in both information dissemination and feedback, according to Schramm (1964:81, 123). Depending on the medium used, long channels also may be slow (Holt and Turner, 1966:300, 302). Under these circumstances, it is expected that high centrality of mass communication information control will not be associated with rapid development in large countries.

FUNCTIONAL DIFFERENTIATION

Functional differentiation may be defined, in system terms, as the emergence of new components to fulfill distinct functions (Marsh, 1967:31ff). As this process proceeds over time, systems may become more or less functionally differentiated.

Functional differentiation is strongly associated with national economic development (Marsh, 1967:34). New functions arise in the economic system as development proceeds, and new structures are created to perform them.

All contemporary nations are highly differentiated functionally in comparison to, for example, primitive hunting societies. Yet there are considerable variations in level of differentiation among the world's nations (Marsh, 1967).

Whether a country is relatively low or high in the scale of functional differentiation, it will require some form of coordination of the components which are performing different functions. The basic nature of this need for coordination was recognized in the 19th Century by such sociologists as Comte and Spencer. Without integration of functionally differentiated components, society faces disintegration and instability.

In contrast to the heterogeneity and size variables, it is expected that centrality of mass communication information control will be associated with development in countries which are both low and high in level of functional differentiation. Regardless of the specific level of functional differentiation in a country, the need for coordination of components in the complex contemporary state remains.

METHOD

Data were drawn from three sources to serve as indicators for the concepts of centrality of mass communication information control, development, functional differentiation, cultural heterogeneity, and size. Number of nations was 75.

Centrality of mass communication information control was indexed by a scale constructed from nine of Lowenstein's (1967a)

PICA variables.[5] The variables used were chosen because it was felt they would reflect degree of central control over mass communication. The mean score across the nine variables was obtained for each country, and the resulting distribution was trichotomized.[6] (See Appendix A for minimum and maximum values and cutting points for this and other variables. In all instances of tri- or dichotomizing, an attempt was made to have as nearly equal numbers of cases in each category as possible, given the raw distributions.)

Development was indexed by data on the average annual growth rate in gross national product for 1960-1965. They were drawn from the Taylor and Hudson World Handbook II (1972), as found in the data set distributed by the Inter-University Consortium for Political Research (1971). This distribution was also trichotomized.

All remaining distributions were dichotomized, except for the racial and religious heterogeneity variables. They were coded as dichotomies in the original data sources.

Functional differentiation was indicated by three variables, literacy rate and, on a per capita basis, newspaper circulation and gross national product. The strong association between functional differentiation and level of gross national product was discussed by Marsh (1967:34). In the absence of a direct indicator of level of functional differentiation, it appears to provide satisfactory indirect evidence. Literacy and per capita newspaper circulation are two additional variables which appear to bear a strong relationship to functional differentiation and

which, as will be seen below, are highly correlated with gross national product per capita. Data on all three variables were drawn from the World Handbook II (Taylor and Hudson, 1972).

Cultural heterogeneity was indicated by four different variables. Again from World Handbook II came data on ethno-linguistic heterogeneity. From the Banks and Textor Cross Polity Survey (1963) came data on linguistic, racial, and religious heterogeneity.

Correlations among the functional differentiation, cultural heterogeneity, and size variables, in the tri- or dichotomized form indicated above, were low to moderate in magnitude. (See Table 1.)[7] The correlation with the greatest absolute

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Table 1 goes about here
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value was between linguistic heterogeneity and literacy. Apparently substantial diversity in intra-national languages resulted in difficulties in literacy training. There was a tendency, also, for the countries with the greatest heterogeneity in language to be the poorer ones, and lack of educational funding hampers literacy achievement. The overall pattern of relatively low coefficients indicates that the sets of variables may be viewed as relating to substantially different underlying concepts.

Correlations among the three functional differentiation variables were all quite high, .90 or above. This would indicate they are all related to some one underlying factor.

The set of six coefficients for the cultural heterogeneity variables range from -.04 up through .66. The four variables

seem to be tapping distinctly different aspects of the overall concept of cultural heterogeneity.

FINDINGS

As expected, a relatively small but statistically significant association was found between centrality of mass communication information control and development ($\underline{tau}_b$ = .14, p = .03; see Table 2).[8] The same focal relationship was

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somewhat larger, and still statistically significant, when the sets of countries low and high in functional differentiation were examined separately.[9]

Looking at countries low in cultural heterogeneity, the development-centrality of mass communication information control association was roughly double the focal coefficient of .14 for all four heterogeneity indices. In each case the tau coefficients were statistically significant.

However, countries high in cultural heterogeneity exhibited a quite different pattern of coefficients, again as predicted. For those countries two of the four coefficients were only 0.01 in absolute value, and the other two actually took on negative values which were statistically significant.

The differences between the low and high heterogeneity coefficients were statistically significant for three of the

four indicators of cultural heterogeneity, and the fourth had a probability of 0.069. This is in contrast to the functional differentiation indicators, where none of the three low-high differences were statistically significant.

Small countries again showed a moderate and statistically significant degree of association between centrality of mass communication information control and development, while for large countries the coefficient was only 0.02. The difference was not statistically significant, however, with a probability of 0.086.

The six functional differentiation tau coefficients ranged from 0.18, for low gross national product per capita, to 0.36, for countries high on that variable. Mean of the six was 0.28. This is just twice the value of the global correlation between the two focal variables.

It is also just slightly less than the mean of the five correlations for the low values of the cultural heterogeneity and size indicators. That mean was 0.29.

The similarity between the two means is striking, and it lends itself to the interpretation that a basic role of high centrality of mass communication information control in development is one of coordination of functionally differentiated system units within relatively small and homogeneous systems.

CONCLUSION

Decisions about national communication policy are being made today. Considering the current stress on the subject,

additional official actions defining the place of the mass media appear likely in the near future. One of the questions of most vital importance in communication policy deliberations concerns the extent to which control over mass communication information should be centralized into the hands of a small group of national leaders.

Little research has been done on the effects of centralization of mass communication information control, however. The present study represents a first step toward empirical investigation of its implications for national development.

It was found that there is a small positive association between centrality of mass communication information control and rate of growth of gross national product. The association increased in magnitude for small and culturally homogeneous countries, but disappeared or became negative for countries which were large or culturally heterogeneous. The association between centrality of mass communication information control and gross national product growth rate was positive for both a group of countries low in functional differentiation and for a group with higher values on that variable. A basic role of high centrality of mass communication information control may be coordination of functionally differentiated system units in small and homogeneous systems.

Such generalizations must be viewed cautiously, however. Several limitations seriously circumscribe the study. The theory on which the empirical work is based remains imprecise.

Questions may be raised as to the appropriateness of the entitation, especially in light of recent work concerning the role of multinational corporations. Operationalizations are mostly indirect; in addition, other problems of validity and reliability are present.[10] The usual problems of attempting to generalize about processes from synchronic data are faced. There is also the possibility that the results obtained here may be due to some particular historic configuration unique to the early 1960s period.[11]

More attention needs to be given to processes which affect centrality of mass communication information control, including development itself.[12] (See Weaver, 1974.)

Additional concepts need to be integrated into the theoretical framework, as well as refining those used. For example, the concept of "goal" as applied to countries seems in need of a good deal of attention. Multiple and internally conflicting goals appear to need explicit consideration. Totalitarian societies may place much more stress on development, as defined here, as well as exhibiting a higher degree of centrality of control of mass communication information. Lack of consumerist goals in such societies may contribute to an accelerated pace of gross national product growth.

Despite the necessarily tentative nature of conclusions drawn from this study, they do indicate that communication policy planners should seriously consider the implications for development of decisions which affect centrality of mass

communication information control. Further research is needed to establish with greater precision the nature of the relationships among the concepts considered here, as well as to provide more direct evidence of casuality. Considering the stakes for the people of the developing countries, additional research would seem a small step before establishing communication policy structures which this study suggests may have deleterious consequences in some nations.

NOTES

1. Information control is any process affecting the rate of flow or types of messages passing through a system. "All communication processes have a control function within them . . . "(Donohue, Tichenor, and Olien, 1973:653).

Crucial among the wide variety of information control processes affecting mass communication is selection of messages to be distributed according to the definitions of reality and the operating procedures established by those who occupy key positions in the source component of a mass communication system (Breed, 1955, 1964, Gieber, 1964; White, 1950). The definitions and procedures, in turn, are in large part determined by other factors. Among the most important of these are cultural norms and socialization practices.

Information control processes may lead to total closure of some types of message flows, constrictions of other flows, introduction of distorting information, and overloading of channels. (See Gerbner, 1961; Kebkonen, 1973; Marceau, 1972; Molotch and Lester, 1974; Rao, 1966.)

Legal censorship is one important means of closure or constriction of message flow. If censorship is sufficiently harsh, however, after a time it will no longer be necessary for the legal mechanism to come into play explicitly. In such a case, as in Nazi Germany (Kiefer, 1974:97), much of the control originally under legal processes will come to be performed as part of normal operating procedures.

Legal sanction is not necessary for censorous activities, however. An illustration is provided by Rao (1966), in his study of development in two Indian villages. In Rao's model, communication impinges on an economic system, creating new stresses. At the very earliest points of development the system is closed, as in an isolated rural village.

The communication-induced stresses are felt first by the elite of the system, who perceive new opportunities in messages from outside (Rao, 1966:111). If the opportunities are consonant with the culture of the system, they will be seized, first by the elite and gradually by larger and larger portions of the populace.

Diffusion throughout the components in the economic system depends, however, on the presence of information sources perceived as neutral between competing, or potentially competing, power factions within the system (Rao, 1966:112). If sources are viewed as biased with regard to political factions, a new set of information control processes will come into play. These processes will halt information distribution, thereby removing the stress-creating factors in the economic system and returning it to the status quo ante.

Information channels may be closed completely by elites or distorting messages may be introduced if they feel threatened. (Rao, 1966:111-112; see also Marceau, 1972.) Events favorable to overall economic development will be permitted only to the extent that they are consonant with elite interests; elites control the information flows which by and large lead to the occurrence of innovative events.

2. Any society must have some minimal level of centrality of communication to be said to exist, according to Levy (1966:488-489). Throughout this paper, the term "centralization" is used to refer to an aspect of the process of mass communication information control, and "centrality" to the corresponding state at a given time.

3. Though not explicitly considered in the present work, it is realized that nations may have conflicting goals, and that economic growth may not be the primary goal. Further, it should be noted in connection with any work dealing with control of mass communication that the contention has been made that national goals are in many cases strongly affected by mass communication policies of other countries or of foreign organizations. (See, for example, Schiller, 1967, 1970, 1974; Wells, 1972.) Beyond that, although some have held that all nations have goals, explicit or implicit (Moeller, 1974:1), other have argued that the concept, at least as used in general systems theory, is not presently applicable to contemporary societies (Buckley, 1967:206).

4. Both the distributive and feedback aspects of information control are discussed by Donohue, Tichenor, and Olien (1973).

5. The nine variables, with their original PICA variable numbers, were:

5. News and editorial personnel (all media) subject to government licensing, certification, and appointment.
6. Favoritism in release of government news.
7. Media allowed to utilize services of foreign news agencies. [Though worded in the opposite direction from other variables, this one was coded in the same direction as all the rest.]
8. Government control over domestic news agencies.
9. Print media subject to governmental licensing.
10. Government control of circulation and distribution, not including postal service.
13. Government or "government party" ownership of media (including radio, television and domestic news agencies).

14. Publications of opposition political parties banned.

18. Government subsidies and/or bribes to press and newsmen. (Lowenstein, 1967b:1-2)

The remaining 14 PICA variables were not used. For a variety of reasons, it was felt they were less satisfactory as indicators of centrality of control.

6. Direction was reversed after finding means across variables, so that a high score indicated high centrality of mass communication information control and a low score indicated low centrality.

The nine PICA variables did not meet the criteria for a unidimensional cumulative scale.

The final scale of centrality of mass communication information control was trichotomized, along with the indicator of development, because the theory on which the empirical analysis rests did not seem to provide an appropriate basis for a finer analysis, and because the data are generally open to some suspicion as to the validity even of rankings, much less if considered as if an interval level of measurement had been attained.

The other variables, all of which were dichotomized, are open to the same theoretical objection to their treatment as if a high level of measurement had been obtained. In addition, for the type of analysis to be performed, cell numbers would have been quite low if more than two categories had been used.

7. Coefficients are based on the set of 3 x 3, 3 x 2, and 2 x 2 tables generated when correlating each of the variables described above with all the others. The data were analyzed in this manner, rather than as continuous rank-order distributions, for the same reasons they were tri- or dichotomized in the first place (see footnote above).

The common practice of presenting probabilities and discussing "statistical significance" even though no sample was drawn is followed here. The probabilities may be interpreted as the figures that would be obtained if the data were based on a representative sample of all countries. They are presented as an aid to interpreting the coefficients of association.

8. All coefficients in Table 2 are Kendall's $\underline{\text{tau}}_b$. Number of cases for the global relationship was 75.

The procedure for obtaining the coefficients for the three functional differentiation variables, the four cultural heterogeneity variables, and the size variable was as follows: Using the dichotomies indicated above, countries with low values on each variable were grouped

together; separate groups of countries high on each variable also were formed. Within each of these 16 subgroups (two for each variable), the centrality of mass communication information control and GNP growth rate variables were cross-tabulated. The same trichotomies as indicated earlier for these two variables were used for the subgroup tables. The coefficients of association were computed for the separate subgroup tables.

The subgroups of countries low and high on the control variables ranged in number from 17 to 52, with just one subgroup at each of these extremes. All other subgroups fell within the 27 to 40 range in number of cases. Uneven splits between the low and high subgroups resulted from unequal distributions in the original raw data.

The term "control variable" is used here in the sense of a variable upon which one controls in order to specify further the nature of the relationship between two focal variables. See Rosenberg (1968, Chapter 6) for discussion of specification.

Only those analyses specifically indicated by the theoretical framework are reported here. While other relationships may well be interesting and important, the present report deals only with relationships of direct theoretical relevance in the sense of following immediately from the reasoning given in the first sections of the paper.

9. The question naturally arises as to whether the observed correlations between centrality of mass communication information control and development are genuine or spurious. Two aspects of the question will be considered here.

First is whether there is any combination of variables such that the observed global correlation might be considered merely an artifact of other, more plausible correlations. If the focal relationship were merely one weak link in a chain of strong correlations, it might be explained as a result of the other links, rather than being of intrinsic importance.

Examination of the pattern of correlations among all the variables (presented in Table 1) indicates that this is not the case. First, there were no extremely high correlations with either of the two focal variables. The highest in absolute value was between centrality of mass communication information control and literacy, at -.54. Literacy, in turn, was very strongly related to both newspaper circulation (.93) and gross national product per capita (.90). But neither of these two variables had a strong relationship to gross national product growth rate, which would be required to complete a causal chain.

Similar results were obtained from examination of the patterns of correlation for the two variables which followed literacy in the magnitude of the absolute value of their correlations with centrality of mass communication information control. The two variables were newspaper circulation (-.46) and gross national product per capita (-.39). Variables which showed a strong relationship to these two were not in turn highly correlated with gross national product growth rate.

The second aspect of the question of spuriousness considered here relates to the patterns of correlation obtained when the focal relationship was examined under the low and high values of the control variables. Conceivably the differences found in the focal correlation coefficients between low and high values of the heterogeneity and size control variables might be explainable as a statistical artifact. The correlations shown in Table 1 might have constrained the relationship between the two focal variables so that the differences found between the focal correlation coefficients from low to high values of the control variables were inevitable.

This was not the case. The global correlation between centrality of mass communication information control and development, at .14, was low enough that a wide variety of values of tau would have been possible for the partial tables. The relationship between centrality of mass communication information control and development did have a wide range within which it could vary, and the results obtained were not merely statistical artifacts.

10. For example, there appears to be no clear consensus in the economic literature on the period over which one must examine GNP growth rates in order to come to conclusions about "development". Some sources seem to feel a five-year period suffices; others would appear to require at least 10-15 years; yet others indicate a much longer time span, on the order of 50 years, is necessary to speak of "development" as opposed to short-term fluctuations. The appropriate period must, of course, be related to the particular theoretical approach; little work was found which related explicitly related national goals, information, and development.

11. If the study were replicated for the period since the energy crisis, it seems likely that much the same conclusion about the global relationship would be reached, according to indications in current news reports.

12. Rapidly changing communication technology appears likely to extend the possibilities of centralization of control of mass communication information. It may be that changes in control resulting from changing technology will be so far-reaching as to require revision of basic thinking concerning the consequences of control. For example, radio has been described as a decisive factor in the rise of the totalitarian form of government (Innis, 1972: 165). The technology of 1984 appears close to realization; the social structure may be ripe for its adoption in the form Orwell feared.

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TABLE 1

CORRELATIONS AMONG ALL VARIABLES

Variable name	No.	1[a]	2[a]	3	4	5	6	7	8	9
Cent. of control	1									
GNP growth	2	0.14[b]								
Newspaper circ.	3	-0.46	0.08							
Literacy	4	-0.54	0.10	0.93						
GNP per capita	5	-0.39	0.15	0.94	0.90					
Ethnolin. hetero.	6	0.11	-0.18	-0.22	-0.29	-0.28				
Linguis. hetero.	7	0.32	0.02	-0.30	-0.41	-0.34	0.66			
Racial hetero.	8	-0.25	-0.02	-0.22	-0.21	-0.21	-0.01	-0.04		
Relig. hetero.	9	-0.14	-0.07	0.05	0.08	0.01	0.49	0.23	0.14	
Geographic area	10	0.04	-0.04	-0.10	-0.29	-0.12	0.25	0.14	-.11	-0.16

[a]All coefficients in columns 1 and 2 are Kendall's tau_c, except for the uppermost one in column 1; that one, and all the coefficients in columns 3 through 9 are tau_b.

[b]All coefficients of 0.14 or above are statistically significant at the 0.05 level; coefficients below 0.14 are not.

TABLE 2

RELATIONSHIP OF CENTRALITY OF MASS COMMUNICATION INFORMATION CONTROL TO DEVELOPMENT

Global relationship			tau = 0.14 (p = 0.03)			
Within levels of control variables	Low		High		Absolute value of difference in taus	(Pdiff.)
	tau	(p)	tau	(p)		
Functional differentiation variables						
Newspaper circulation	0.34	(0.002)	0.31	(0.004)	0.03	(0.433)
Literacy	0.22	(0.03)	0.29	(0.009)	0.07	(0.352)
Gross national product per capita	0.18	(0.05)	0.36	(0.001)	0.18	(0.140)
Cultural heterogeneity variables						
Ethnolinguistic	0.34	(0.001)	-0.01	(0.45)	0.35	(0.019)
Linguistic	0.27	(0.009)	0.01	(0.47)	0.26	(0.069)
Racial	0.28	(0.002)	-0.30	(0.04)	0.58	(0.002)
Religious	0.32	(0.001)	-0.26	(0.02)	0.58	(<0.001)
Size variable						
Geographic area	0.26	(0.01)	0.02	(0.43)	0.24	(0.081)

APPENDIX A

CODEBOOK

Var. No.	Abbreviated variable name	N[a]	Original form			Final Form	Source
			Minimum	Maximum	Cutting Point(s)		
1	Centrality of MC control	75	0.29	7.71	1.40, 3.00	Tri.[b]	L[c]
2	GNP growth rate	75	0.4	9.6	4.4, 5.8	Tri.	T & H[d]
3	Newspaper circulation	67	2[e]	505	68.5	Di.[f]	T & H
4	Literacy	62	5.0[g]	100.0	73.0	Di.	T & H
5	GNP per capita	75	45.1[h]	3,574.5	390.0	Di.	T & H
6	Ethnolinguis. hetero.	75	0.0	0.926	0.306	Di.	T & H
7	Linguistic hetero.	70	1	3	1	Di.	T & H
8	Racial hetero.	69	1	2	none	Di.	B & T[i]
9	Religious hetero.	67	1	2	none	Di.	B & T
10	Geographic area	75	9.3[j]	22,402.2	290.0	Di.	T & H

[a]Number of cases for which data were available.

[b]Trichotomy.

[c]Lowenstein (1967a).

[d]Taylor and Hudson (1971).

[e]Copies per 1,000 population.

[f]Dichotomy.

[g]Percentage of adult population literate.

[h]In U.S. dollars.

[i]Banks and Textor (1963).

[j]In 1,000 square kilometers.